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TI Spectroscopic Characteristics and Intermolecular Interactions of Thiophene/Phenylene Co-Oligomers in Solutions
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PB American Chemical Society
DT Journal
LA English
CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 73, 76
AB The electronic spectra of thiophene/phenylene co-oligomers were obtained in solns. and compared with those of oligothiophenes and oligophenylenes, as a class of organic semiconductors. The spectra are influenced by the mol. size and sequence arrangement of thiophene/phenylene chains. In the dilute regime (.apprx.10-5 M), monomer emissions prevail. The quantum efficiency of fluorescence emission of co-oligomers is 0.79 and 0.74, for 4,4'-bis(2-thienyl)biphenyl (T2P) and 1,4-bis(5-phenylthiophene-2-yl)benzene (AC5), resp. The exptl. data in the dilute regime were compared with results of quantum chemical calcns. at semiempirical levels. Intermol. interactions become increasingly important at higher concns. The spectroscopic characteristics in this regime were studied for 2,5-diphenylthiophene (P1T), 5,5'-diphenyl-2,2'-bithiophene (P2T), and 1,4-bis(2-thienyl)benzene (T1P). By increasing the concentration, the co-oligomers show well-structured emission that is red-shifted relative to the monomer emission bands. New absorption shoulders appear in the longer wavelength region due to intermol. interactions. These features are assigned to intermol. ground-state complexes with fully overlapped π-π groups. Besides the above spectral features, T1P exhibits a long tail toward .apprx.700 nm in the absorption spectra at higher concns. and a broad emission band around 520 nm replaces the strong band at 450 nm. These features are assigned to intermol. charge-transfer from a thiophene to a phenylene ring. The fluorescence emission of co-oligomer thin films are also red-shifted relative to the monomer emission. The origin of these emissions in the solid state was also studied. The oligomers and corresponding conducting polymers are of interest for use in electronic and photonic devices.
ST thiophene phenylene oligomer electronic excitation chain sequence; fluorescence emission thiophene phenylene oligomer soln concn; conjugation chain electron transfer polythiophene polyphenylene; conducting polymer thiophene phenylene oligomer fluorescence
IT Polymers, properties
RL: PRP (Properties)
(conjugated; electronic excitation and mol. sequence and concentration effects
on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT Charge transfer interaction
Conducting polymers
Electronic excitation
Fluorescence
UV and visible spectra
(electronic excitation and mol. sequence and concentration effects on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT Polyphenyls
RL: PRP (Properties)

(oligomeric; electronic excitation and mol. sequence and concentration effects
on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT Polymers, properties
RL: PRP (Properties)
(polythiophenes, oligomeric; electronic excitation and mol. sequence and concentration effects on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT Polymer chains
(sequence and conjugation length; electronic excitation and mol. sequence and concentration effects on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT 1445-78-9, 2,5-Diphenylthiophene 1665-32-3, 5,5''-Diphenyl-2,2':5'2''-terthiophene 23354-94-1, 1,4-Bis(2-thienyl)benzene 83495-30-1, 5,5'-Diphenyl-2,2'-bithiophene 109359-51-5 238397-96-1 238397-97-2, 5,5'''-Diphenyl-2,2':5',2'':5'',2'''-Quaterthiophene 256342-39-9
RL: PRP (Properties)
(electronic excitation and mol. sequence and concentration effects on absorption and emission spectra of thiophene/phenylene oligomers in solution)
IT 25190-62-9, Poly(p-phenylene) 25233-34-5, Polythiophene
RL: PRP (Properties)
(oligomeric; electronic excitation and mol. sequence and concentration effects
on absorption and emission spectra of thiophene/phenylene oligomers in solution)
RE.CNT 65 THERE ARE 65 CITED REFERENCES AVAILABLE FOR THIS RECORD
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IT 109359-51-5
RL: PRP (Properties)
(electronic excitation and mol. sequence and concentration effects on absorption and emission spectra of thiophene/phenylene oligomers in solution)

RN 109359-51-5 CAPLUS
CN Thiophene, 2,2'-[1,1'-biphenyl]-4,4'-diylbis- (CA INDEX NAME)